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Volume 3 Number 10



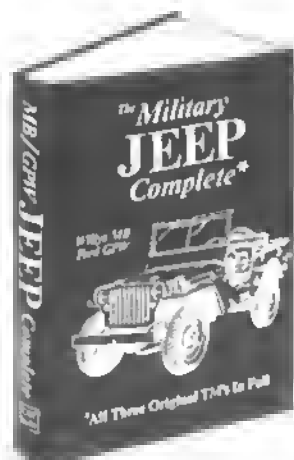
In this Issue — A Serialized Book ; "AFV's of Italy"

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MEMBER I F M S

Continuing in this issue, AFV-G2 is presenting the first complete illustrated History of the Armored Fighting Vehicles of the Italian Army. Authored by Dr. Nicola Pignato, a widely-known historian on the Italian Armed Forces, this serialized book is available only to readers of AFV-G2. This issue's supplemental sheets will be found at the center of the magazine, between pages 16 and 17; they are designed for easy removal and binding together in a separate binder. When collated together, the separate supplemental sections from AFV-G2 will form a detailed history of all Italian Armored Vehicles, with many previously unpublished photographs and 1:50th scale drawings, including new material on the colors and camouflage used by the Italian Army. To remove the center supplemental sheet in this issue, use a razor blade or sharp knife to slit between the staple holes in the sheet, which will then be free of the magazine. Readers may then punch the sheet with a three-ring binder punch, and place it in a binder with the other supplemental sheets to be published with every issue of AFV-G2. The sheets are separately numbered in consecutive order for easy binding and each set of supplemental sheets will contain a chapter or section of the complete book. At the end of the run, a complete index and a table of contents will also be furnished to readers to complete the book.



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COVER: A M3 75mm Gun Motor Carriage sporting an unusual camouflage paint scheme being off-loaded from an LST during the invasion of the island of New Britain by the U. S. Marines. The cover photo is courtesy of the White Motor Corporation. For more on this unusual vehicle, see the article on page 4.

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The AFV-G2 is a magazine, published monthly, for Armor Enthusiasts, with the purpose of gathering and disseminating information about Armored Fighting Vehicles and their employment; to provide an opportunity for persons seriously interested in the History of Armored Fighting Vehicles, in the modeling of these AFV's and associated equipment, and in the playing of military Wargames utilizing miniature AFV's, to share ideas and items of mutual interest, and to promote an interest and awareness in the subject of AFV's.

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The T-12

Halftrack



75mm Gun Motor Carriage

Part I. Development

by Rick Fines

The 75mm Gun Motor Carriage, T-12, was intended as a fast, highly mobile armored vehicle to be deployed against and to destroy enemy tanks. The gun mounted in the vehicle was the venerable M1897A4 75mm gun, commonly known as the "French 75", of pre-World War I. vintage. In fact, the tubes actually mounted on production vehicles dated to and before the first World War! The basic carriage vehicle was a modified Half-Track Personnel Carrier, a lightly armored (1/4") vehicle that was never intended to directly engage the enemy. The term "highly mobile" was also rather questionable in view of this author's experience, to be expanded on later, in driving a M-16 Half-Track over improved roads.

The critical need for an expedient tank destroyer led to a procurement contract for 36 test vehicles, to be designated as the Gun Motor Carriage T-12; this contract was dated July 31st, 1941. These early T-12's used the World War I. 75mm gun in combination with the shield and other hardware from the towed version of the gun on the 1930's high-speed carriage. Modifications to the vehicle included frame reinforcement, forward hinging windshield armor to allow depression of the gun tube, a shield for crew protection, and, of course, stowage modifications.

The T-12 was standardized as the M3 75mm Gun Motor Carriage on October 30, 1941, following testing, and the production contract was assigned to the Autocar Company of Ardmore, Pennsylvania. In 1941, 86 vehicles were delivered to the Army; this was followed by 1,350 in 1942 and 766 in 1943. A slightly different version which used a modified M1897A4 gun was designated as the M3A1; this version first appeared in April of 1943. Total production of the 75mm tank destroyer was 2,202 vehicles.

The M3 series saw extensive - and rather unsuccessful - service in North Africa as a tank destroyer. While service history will be covered in more detail at a later date, suffice it to say that the mortality rate of the Half-Track tank destroyer was such that by the time of the invasion of Sicily, the vehicle had been relegated to use as an artillery piece for infantry support. After the invasion of Italy, most of the vehicles in American service were given to the British forces as lend-lease aid and were used simply as mobile artillery until the tubes wore out. Interestingly enough, the T-12/M3 had shown itself inadequate for its intended purpose before even half of the total production run saw combat service.

Late in 1943, the Autocar Company began dismantling and re-converting 113 vehicles to M3A1 Half-Track Personnel Carrier configuration; the company was awarded a contract to recon-vert an additional 1,247 vehicles in the same manner. On completion of this reconversion, 842 of the Half-Track Tank Destroyers had actually seen Army service, and most of them were by then in British hands. The gun tubes removed during reconversion were presumably mounted again on the wheeled carriages from which they had been originally removed.

Since all of the old World War II. movies and other assorted propaganda depict the Half-Track (in all of its versions) as an incredibly strong, well-designed, fast and powerful vehicle, some developmental notes on the vehicle are in order. This information, of course, applies to all of the Half-Track variants, as well as to the T-12/M3 Gun Motor Carriage.

The U.S. Army had, on an off-and-on basis, experimented with the Citroen Half-Track vehicle and others through the 1920's, but the vehicle that eventually became the World War II. Half-Track was not actually designed conceptually as a result of these experimentations - the vehicle literally just happened.

In the late 1920's, both the Linn Manufacturing Company and James Cunningham & Sons Company were producing what amounted to a Half-Track conversion kit for Ford and other trucks. Their advertising was aimed towards construction and municipal use. No front axle drive was provided. Sufficient attention was attracted by these conversions that a pilot Half-Track, designated as the T-1, was procured from Cunningham & Sons of Rochester, New York, in 1932. The Cunningham Company was an old-line manufacturer of very high quality carriages and later produced a similarly high quality automobile. In the 1930's, Cunningham also produced prototype tanks, armored cars and aircraft. Today, Cunningham manufactures toilets for campers.

Experimentation led to the production of a small number of soft-skinned vehicles, using



An early T-12 75mm Gun Motor Carriage in action during maneuvers in 1941. The Squad Leader (a Sergeant) in the cab is pointing out a suspected target to the Gunner and Assistant Gunner. The flag and staff being held by an Umpire was used to signal to other Umpires the exact moment of simulated firing. Note the blue "WD" or U.S.A. numbers which are partly obscured by a strip of colored cloth used to indicate which "side" the vehicle was on during the simulated war. White Motor Corporation Photo



An early publicity photograph of the T-12 Gun Motor Carriage. This is the same vehicle shown in the un-captioned title photo for this article. Note the "fold-down" armored windshield, which lacks glass, and the early rudimentary gun shield for crew protection. The five-man gun crew shown here was standard for both the T-12 and the later M3. White Motor Corporation Photo

Ford and General Motors commercial truck chassis in combination with the evolving track suspension systems. Thirty vehicles designated T-1E1 were built at Rock Island Arsenal, Illinois, from parts procured from Cunningham; these were identical to the T-1 excepting body configuration. In 1933, new tracks and a rigidly supported idler were installed in four of these vehicles for test, and this vehicle was designated Half-Track Car, T-1E2.

A volute spring suspension was installed in one vehicle for test in 1934, and the vehicle was designated Half-Track Car T-1E3. This volute suspension was similar to the configuration on production versions. In 1933, development of the Half-Track Truck T-1 was also authorized. This vehicle consisted of the standard General Motors Corporation 2-1/2 ton truck, using the suspension of the Half-Track Car T-1E2. The Linn Manufacturing Company constructed a large truck equipped with Linn track suspension; this was designated Half-Track Truck T-3. A special Signal Corps version of the T-1 was designated Half-Track Truck, T-4.

In 1934, a standard GMC truck was redesigned using the track suspension of the T-1. Rubber block tracks were dropped and Goodrich endless band tracks adopted. This vehicle was designated Half-Track Truck, T-5. In addition, Half-Track Truck, T-3 was rebodied and designated as the Half-Track Truck, T-6. Both these vehicles were designed as prime movers for towed field artillery pieces.

At the same time as these various commercial-based trucks were being fitted with track conversions, the Indiana Division of White Motor Company had been developing a 4x4 lightly armored Scout Car. Early models were nothing more than a medium Indiana truck chassis with a light armor touring car body attached. By 1938, both the M2 and M2A1 Scout Car types had been produced, and some 4x4 M3 Scout Cars of the type produced into World War II, were being evaluated at Rock Island Arsenal.

While Indiana was developing this light 4x4 armored Scout Car, and the Army, Cunningham and Linn were experimenting with Half-Track truck conversions, it must be emphasized that the work was only related chronologically. The production of an armored Half-Track had not even been considered until 1938 when some enterprising souls at Rock Island Arsenal undertook

conversion of a M2A1 White-Indiana Scout Car to Half-Track configuration. The resulting hybrid, born of Cunningham, Ordnance, White-Indiana, and Rock Island Arsenal looked not at all unlike what would become the standardized Half-Track vehicle. Considering the profusion of experimental designations of the period, it is interesting to note that this hybrid - more like production models than any other experimental vehicle - was never assigned any designation. So satisfactory was this half-track erector-set vehicle that work was dropped on all soft-skin truck-based Half-Track conversions. Therefore, after a decade of experimentation, the Half-Track Scout Car, T-14, was authorized on December 28, 1939 and was based on a combination that happened as much by accident as much as any other factor. The T-14 Scout Car was the prototype of all other variations in the M3 Half-Track series.

Having historically digressed a bit, it is time to get back to the T-12 and related vehicles. Since the T-12 was made to engage the enemy - in tanks at that - it is reasonable to assume that the T-12's angular body was rather stout, right? Wrong! Except for the folding windshield armor and a few other paperweight-size chunks, the T-12's "armor" was 1/4" plate joined with more nuts and bolts and angles than A. C. Gilbert ever thought of putting in an erector set. The floor boards were about the same thickness as a 1940 Plymouth automobile and such hardware items as door handles and miscellaneous fittings appeared to have come from the local hardware store. Actually, the T-12 provided no protection whatever from mines, had an open driving and fighting compartment, armor that was hard put to stop anything larger than an A. P. rifle bullet and a gun with almost no traverse. Enough pictures of tanks dragging Half-Tracks out of soft spots are available to make one wonder about what must have been the limited capability of the vehicle in the sand of North Africa.

The engine used in the T-12 was the White 160AX series, an L-head gasoline burning powerplant virtually identical to a White commercial product of the 1930's, and similar to all other White and Autocar installations.

- Text continued on Page 29 -



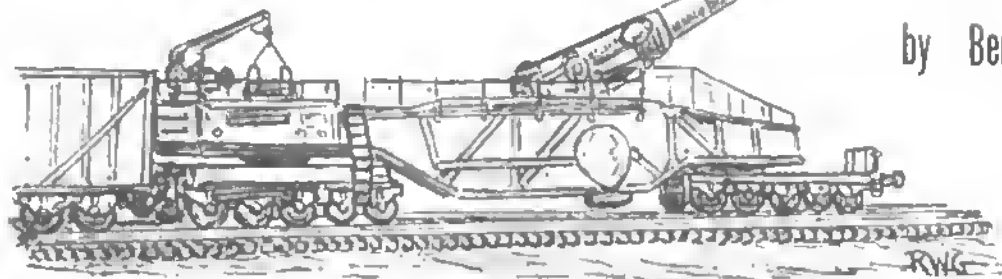
M3 75mm Gun Motor Carriages on display during a "War Show" conducted at the Cleveland, Ohio Stadium in the late spring of 1942. This is a typical publicity photo of the time, with gun barrels "artfully" displayed. The gun shield differences between the T-12 and the M3 are clearly displayed, as well as the differences in front wheel hubs and external stowage brackets.

White Motor Corporation Photo

HILLERSLEBEN;

A German Army Testing Facility

by Benjamin Goetsch



Very shortly after the end of World War II., U.S. Army Ordnance intelligence teams investigated many of the German Wehrmacht's armament research and development centers. They found them to be lavishly equipped with research and testing equipment; the facilities were far more spectacular than all expectations. In short, Germany had research facilities which dwarfed those of any other country. Thus, we must ask the question why did German equipment prove to be so poor, if it had such a tremendous amount of research behind it? For German equipment, while very good, was in most cases inferior to U.S. Army materiel.

One of the main reasons behind this situation was the fact that German scientists could not spend sufficient time on conventional weapons; but were forced to work on the V-weapons. There was also a great deal of duplication, waste and overemphasis on minor details. In most cases, this was a result of the right hand not knowing what the left hand was doing, or both hands continuing their endeavors far beyond the point of diminishing returns. Even the profusion of special equipment could not offset this sort of waste.

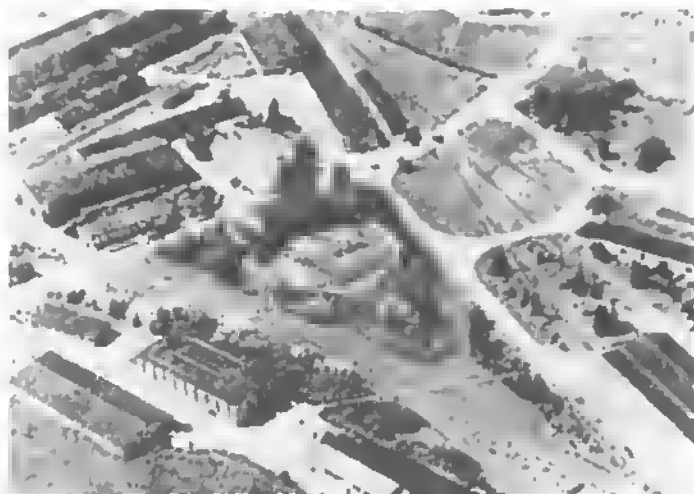
One of the research and testing centers that was investigated by U.S. Army Ordnance was at Hillersleben, in the Province of Saxony, about seventy miles west of Berlin. Hillersleben was devoted primarily to the development of artillery weapons, artillery ammunition and weapons testing. Hillersleben was a part of the Army Weapons Office (Heereswaffenamt). Other activities that carried on there were fortifications development, flash and sound ranging, meteorological and communications development. There was no counterpart in the United States to this facility; the Ordnance Center at Aberdeen Proving Grounds in Maryland is the closest thing to Hillersleben, but at Aberdeen, the military is concerned with everything that falls under the heading of Ordnance.

Hillersleben was built during the period of 1935-43, requiring 70 of the 74 Million Marks allotted for construction by the German government. The grounds were roughly pear shaped, about 19 miles long and 7 miles across at the widest part. The long axis of the proving ground consists of a 700 meter wide firing range, which extends north and south to a range of about 27,000 meters.

The employees at Hillersleben numbered from 3000 to 4000 people, both civilian and military; they lived on the grounds in quarters provided for them.

Actual testing was not set-up by the personnel at Hillersleben, but by higher officials in Berlin. Testing was set-up to such a degree that range officials had to give the orders for safety precautions two weeks prior to the required testing date.

Hillersleben was largely self-sufficient. All facilities, including utilities and housing, were under the control of the commandant. There were guest houses, hospitals, and numerous 2, 4, 6 and 8 family housing for married personnel. A 500-man barracks gave



Aerial photo of part of the facilities at Hillersleben, the artillery testing ground of the German Army.
U.S. Army Photo

quarters for the bachelors. An elaborate telephone system connected almost every part of the grounds; with only a few exceptions, this was underground. Where the telephone system went under test ranges, it was protected by armored shielding. Power was one of the few things that came in from an outside source, but water was supplied from wells on the base. In addition, there was an extensive rail system that connected with the German national railroad system.

Technical facilities were of such magnitude that they find, with but one or two exceptions, no counterpart in the United States. Many mobile measuring units utilized Boulange and camera oscillographs. Photographic facilities were found in almost all of the technical buildings. Boulange chronographs, 6-channel Siemens Universal oscillographs, electronic equipment and cameras of all types were abundant. Also, machine tools were found in stock quantities that baffles the imagination. There were at least eight complete machine shops in and around the grounds. Power was available at outlets at all of the main firing positions. Most of the extensive optical instruments were of Zeiss manufacture.

There were also extensive facilities for the preparation of ammunition. The projectile machine shop was capable of performing all machine operations required in the modification of projectiles. There was a cartridge-case resizing and refinishing plant, an artillery ammunition assembly building, an inert-loading building, a powder weighing building, a high-explosive melting and loading plant, an ammonium-nitrate building, a building for steaming-out high-explosives from shells, many ammunition storage magazines, a constant temperature magazine, and a fuze and primer laboratory; all these gave the ammunition section at Hillersleben more the appearance of an arsenal than of a testing ground.

In all, there were ten firing ranges at Hillersleben. The main one, a range about 16 miles long and 700 meters wide, was provided with a railway which ran the entire length of the range; it was serviced by two gantry cranes with a capacity of 100 tons each. In addition, there was a two-track rail system behind the firing point serviced by a 150 ton crane. At intervals along the left side of the range there were 31 bombproof observation shelters.

The other test sites were devoted to specific functions. These were referred to in German as "Platzen". "A" Platz was primarily used for the training of special troops; a full scale pilot model of the Westwall was built there.

"B" Platz was devoted to the testing of armor-piercing and concrete-defeating projectiles. The firing butts and front were serviced by a 150 ton crane.

"C" Platz was devoted to fortifications. Here were found numerous concrete slabs that had been fired-on by guns.

"D" Platz was designed and built for the testing of tank obstacles, which were constructed experimentally here.

"E" Platz was concerned with the testing of shaped charges. The butts held frames for concrete and armor plates which could be fired on by various weapons at various ranges.

"F" Platz was used primarily for the testing of mine effects on vehicles and apparently for minefield clearance testing that involved remote-controlled vehicles.

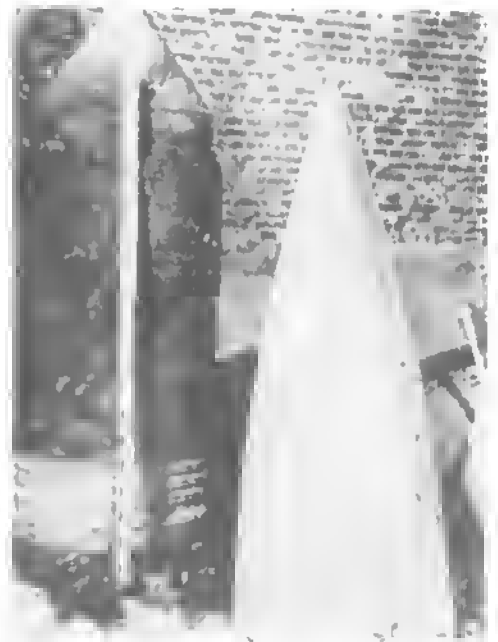
"G" Platz was not completed, even though plans were found; the intended purpose of the range was not clear.

"H" Platz was used to test the 800mm cannon known as "Dora". This range was approximately 1000 yards wide and 1400 yards long. The impact butts at this site show that the weapon was not an ordinary gun; they were 15 feet square and 30 feet deep.

- Continued on Page 29 -



Screen used to deflect projectile fragments in the target butts at "H" Platz. U.S. Army Photo



A projectile for the 800mm gun, found in the projectile factory at Hillersleben. On the right is the windshield. U.S. Army Photo

"THE MODELING OF THE PANZER II SP s.I.G. 33"

BY F.J. "RICK" TYSON

This is the last of three articles dealing with self-propelled guns based on the Panzerkampfwagen II (Sd. Kfz. 121) chassis. In this last article of the series; we are dealing with the conversion of the Tamiya 1/35 scale Pz Kpfw II F/G into the 150 mm GwII (15cm) s.I.G. 33 Howitzer (SF).

The materials you need are: one (1) kit (NOTE: YOU NEED PART OF THE EXTRA KIT NEEDED FOR THE WESPE.), one (1) package of Squadron Shop Sheet Styrene, one (1) Squadron Armor Accessories, and George Bradford's Armor - Camouflage & Markings '40 - '43, and German Tank and Antitank by WE, Inc. all available from any of the SQUADRON SHOPS.

The PzII Howitzer consists of 15 cm heavy infantry howitzer mounted in the hull of a modified, turretless PzII F chassis. The chassis is 33 inches longer than standard F model and has six bogies instead of standard 5 bogies. The track links are extended 14 links each side (same for model).

The shield is in one piece extending straight across the full width of the superstructure. The shield has a vertical slot in it for the standard infantry support weapon to project through and is 15 mm thick.

The gun is 64.57 inches long. The gun tray is a casting containing recuperator and buffer; which is housed beneath the barrel. The gun has a traverse of 11 degrees and elevation of 0 degrees to +73 degrees.

The armor is standard for the hull; while the gun shield is 15 mm, the sides are 15 mm and front plates are 20 mm.

UPON OPENING THE BOX YOU NEED THE FOLLOWING PARTS: 4, 5, 6, 8, 9 10, 11, 12, 13, 14, 20, 21, 22, 23, 24, 31, 32, 40, 41 (plus 2 extra), 42 (plus 2 extra), 43, 44, 45, 46, 2 lower hulls, 2 x 14 extra track links, men, and both tops to be cut up for assembling hull top. Group "A" is .20 sheet styrene, "B" is .30 sheet styrene, "C" is .30 sheet styrene, "D" is .40 sheet styrene, and "E" is .10 sheet syrene.

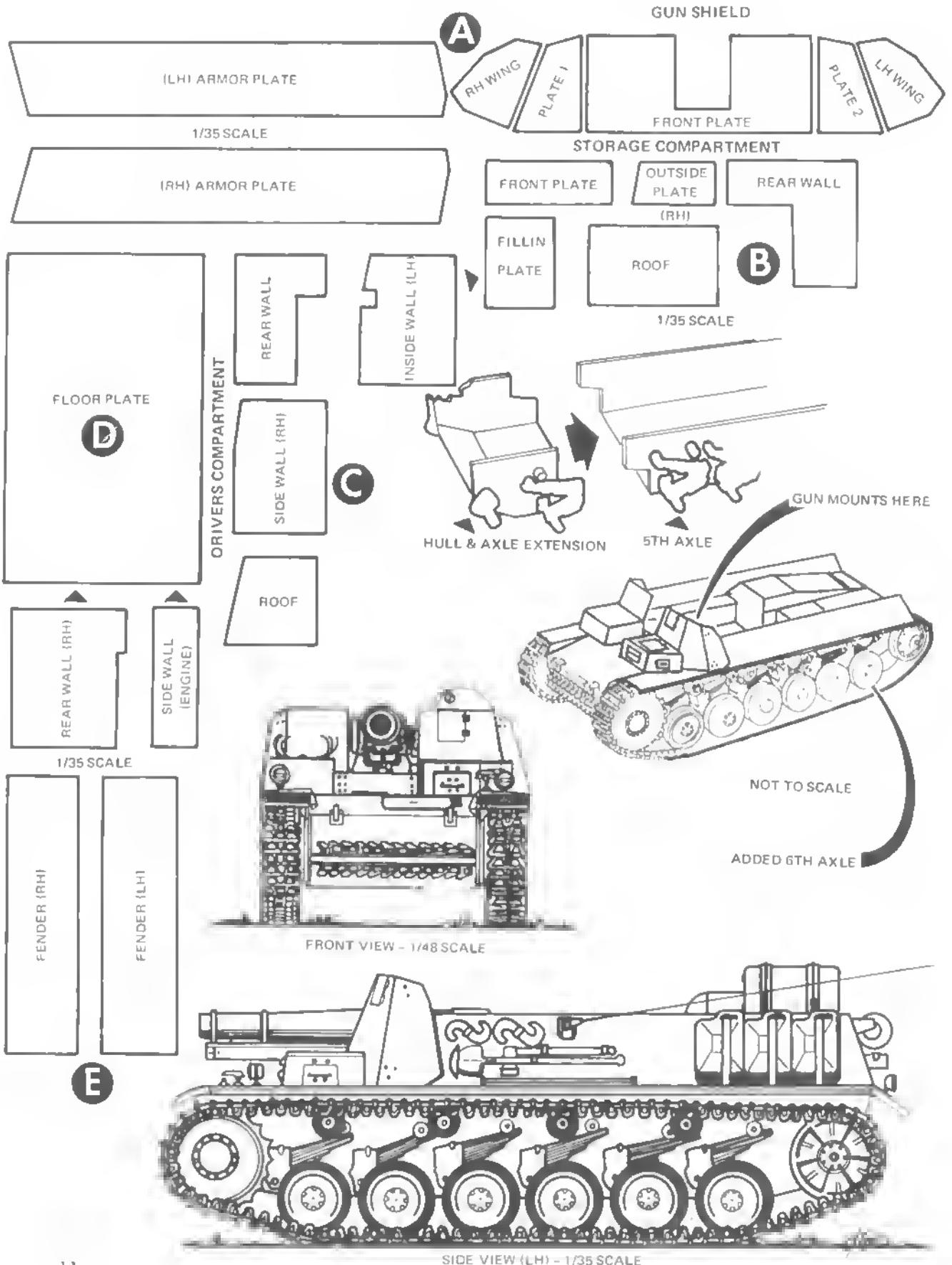
NOTE: TRANSFER OR CARBON PAPER SHOULD BE USED WITH 3H PENCIL TO BE USED TO TRANSFER LINES TO SHEET STYRENE PLACED UNDERNEATH PAGES. USE NO. 11 XACTO BLADE TO CUT AND/OR SCORE ALL CUT AND/OR BEND LINES. CAUTION-USE STRAIGHT EDGE ON ALL CUT LINES AND ALL BEND LINES TO ENSURE ACCURACY IN MODEL.

REFERENCES:

BELLONA HANDBOOK 1, WEAPONS ON GERMAN-BUILT TRACKED CHASSIS
GERMAN TANK AND ANTITANK by WE., Inc.
GERMAN COMBAT WEAPONS Vol. 1 by WE., Inc.
GERMAN TANKS OF WORLD WAR II by von SENGER und ETTERLIN
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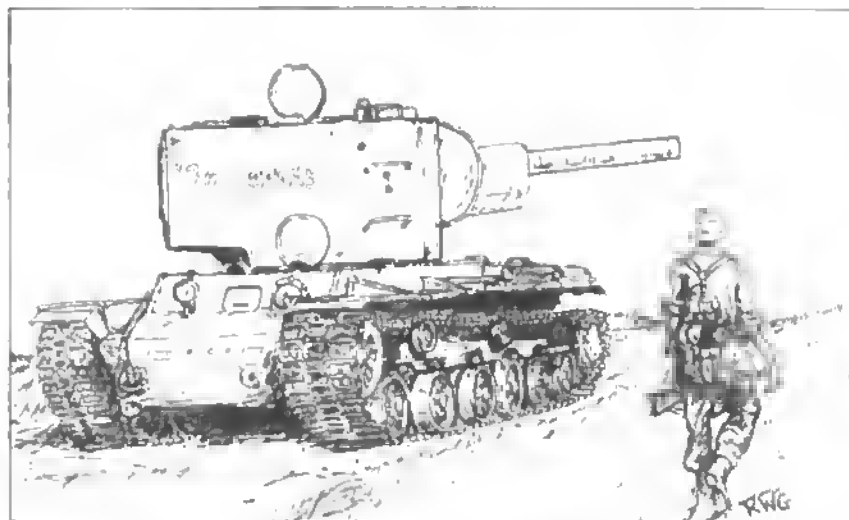




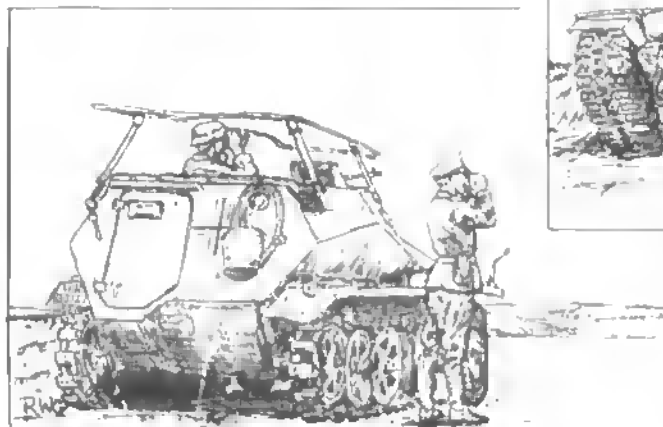
ARMOR ON THE OSTFRONT ... 1941

an Artist's Portfolio, drawn by Robert W. Garbisch

Above: A German Panzer III Ausf. F of the 3. Panzer-Division (Berlin Bear) maneuvers past a burning Soviet T-26 light tank. The T-26 was the standard reconnaissance tank of the Red Army during the 1930's and numbers of them were easily destroyed by German tanks in the opening weeks of the campaign.



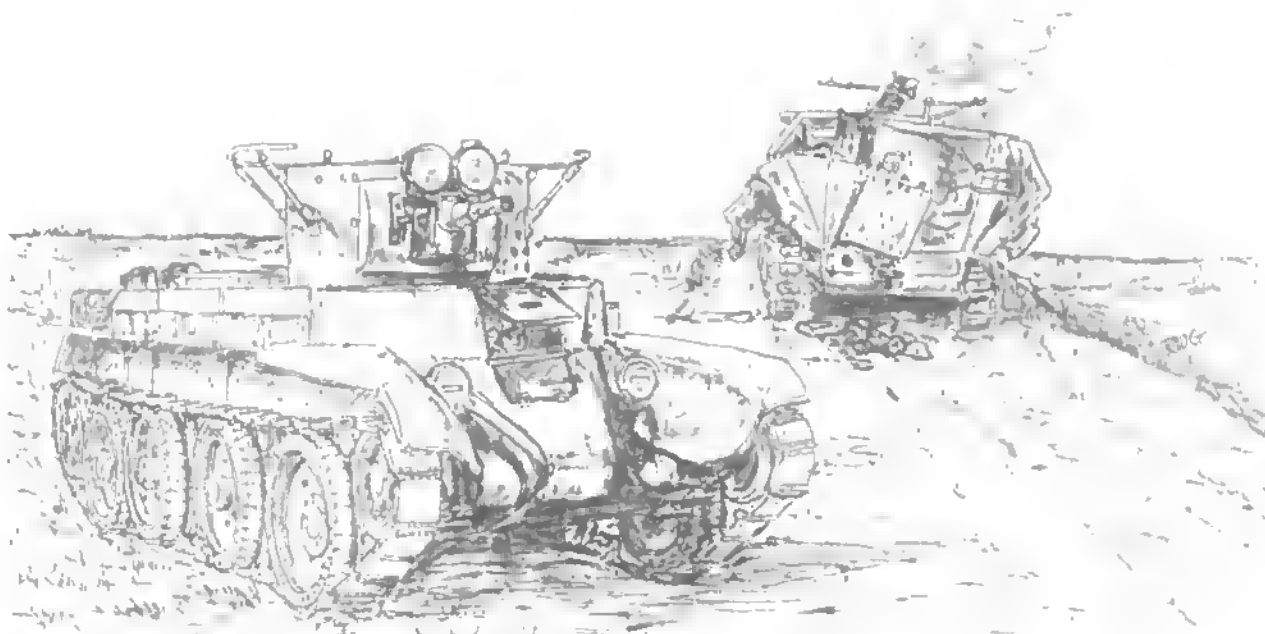
Above: A German infantryman passes an abandoned KV-II heavy tank. These heavy monsters were impervious to the fire of almost every German weapon. Below: A German reconnaissance Sd. Kfz. 250 light halftrack of the 7. Panzer-Division pauses during the advance.





Above: In the opening days of the campaign, a German Panzer 38(t), formerly of the Czech Army, moves down a road further into Russia, past an abandoned STZ Komsomolets artillery tractor. The Panzer 38(t), with its 3.7cm gun, was quickly discovered to be inadequate against Soviet armor, even though the vehicle was mechanically superior to other German tanks of the period. The STZ artillery tractor was encountered by the Germans in some quantity, and numerous examples were later used by the Germans to assist in extricating vehicles from the Russian mud and snow.

Below: A Soviet BT-5(V) command tank swings past a destroyed Sd.Kfz.251 armored personnel carrier. The fast BT-5 was based on a Christie design and mounted a 45mm gun which was effective against the lighter German armor; however, these tanks were employed in piecemeal fashion





ARMOR G-2

Current Data on the World's Armored Forces .

Armor of the Warsaw Pact

by J. C. Johns

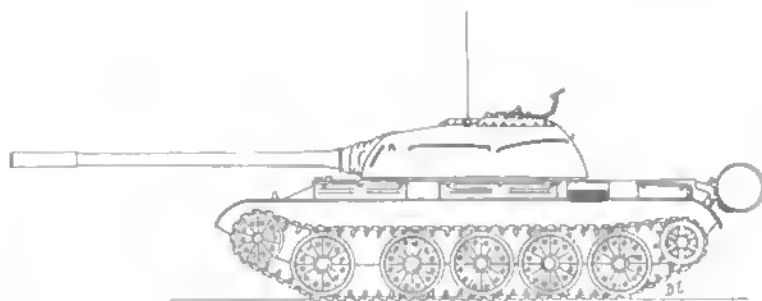
BULGARIA

Strength of Armed Forces: 117,000

Term of Service: 24 Months

Armored Equipment:

30 JS-III, and T-10 Heavy Tanks about 1900 Medium Tanks, mainly of T-54 type, with some T-34, T-55 and T-62 types. There are some PT-76 amphib. light tanks. Reconnaissance vehicles include BTR-40P scout cars with some anti-tank missile equipment. Armored Personnel Carriers

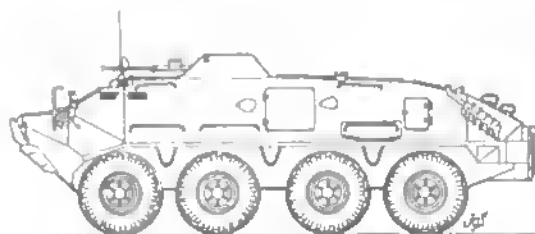


T-54 Medium Tank (early version)

are of the BTR-50, BTR-60 and BTR-152 types.

Artillery: More than 500 85mm, 122mm, 130mm and 152mm towed guns; some SU-152 self-propelled artillery pieces; Frog and Scud Surface-to-Surface Missiles; 57mm, 85mm and 100mm anti-tank guns, SU-100 self-propelled anti-tank guns, Snapper, Swatter and Sagger (NATO designations) guided anti-tank weapons; ZSU-57 self-propelled AA guns and SAM-2 Surface-to-Air Missiles.

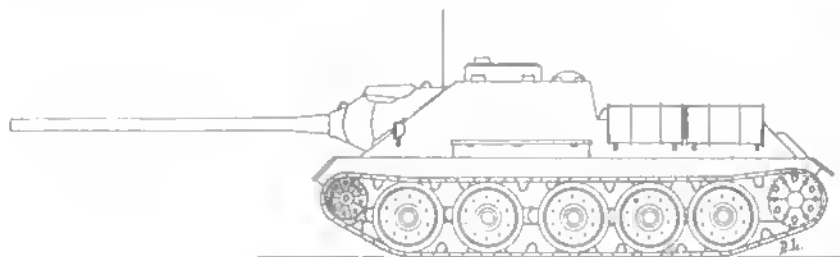
The above equipment is used to form eight Motorized Rifle Divisions (of which three are only at Cadre strength), and five Tank Brigades.



BTR-60PB Armored Personnel Carrier

Paramilitary forces include the Border Security Troops and number approximately 15,000. There additionally is a Voluntary People's Militia of some 150,000, armed with older second-line small arms.

Next Issue: A break in this series for Current Information.



SU-100 Tank Destroyer

The M-3A1 Medium Tank

by William E. Platz

On August 28, 1940, the M3 Medium Tank series was born with the granting of a contract to the Detroit Tank Arsenal for 1000 units. At the time, however, the M3 was little more than a vague concept engineered by the sudden realization that the M2A1 Medium Tank would be no match for contemporary European vehicles. The prime fault of the M2A1 was lack of firepower, and the decision was made that a 75mm gun was a minimum requirement. Unfortunately, the available turret could not take a gun of such size without complete redesign, so the 75mm gun was mounted in a hull sponson, which if it limited field of fire, at least needed a minimum of vehicular modification. The M3 Medium Tank series was admittedly only a "stopgap" measure; but it offered the only hope for a reasonably effective number of modern tanks for the new Armored Force.

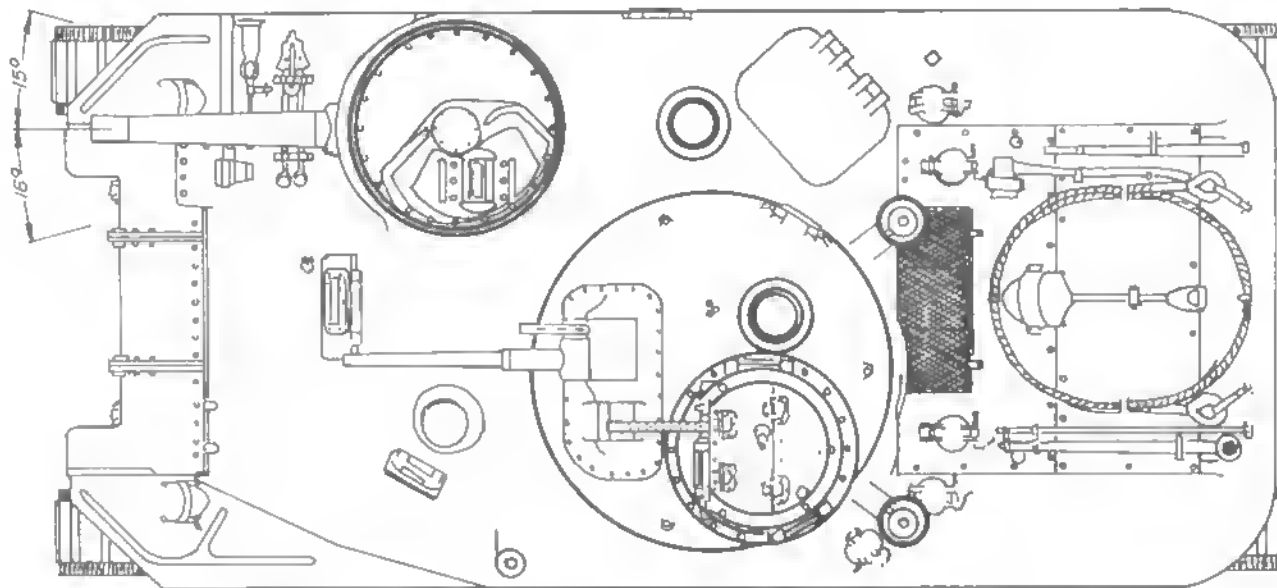
The basic M3 design called for a vehicle of 30 tons with a riveted hull and cast turret. The M2 75mm gun was mounted in the hull sponson (the gun housing itself was also a casting) and a M5 37mm gun was installed in the fully-rotating turret. (This 37mm gun was the same weapon that was being mounted in the M3 Light Tank.) However, before the first medium tanks rolled off the production line in April of 1941, modifications were being made.

The first and most familiar variant of the M3 Medium Tank was the "Grant", a British design which had no U.S. Army designation, even though subsequent vehicles in the M3 series were familiarly known as the "Grant". In October 1940, the British placed orders for M3 Medium Tanks with the Baldwin Locomotive, Lima Locomotive and Pullman companies. These vehicles were to be fitted with a completely redesigned turret which eliminated the machine-gun cupola and reduced the overall height of the Grant to 9 feet, 3 inches. These vehicles were the first M3's to see combat, arriving in Egypt from February of 1942 onwards; and as a result, there has been some confusion as to the designation of the M3 series. The term "Grant" has often incorrectly been applied to all M3 Medium Tanks. In fact, only the vehicles of the original British order, with the special turret, can legitimately be called a "Grant". Thus none of the later U.S. variants, such as the M3A1 shown here in the drawings, are entitled to the designation, though many saw service with the British. All "Grants" were M3's, but not all M3's were "Grants".

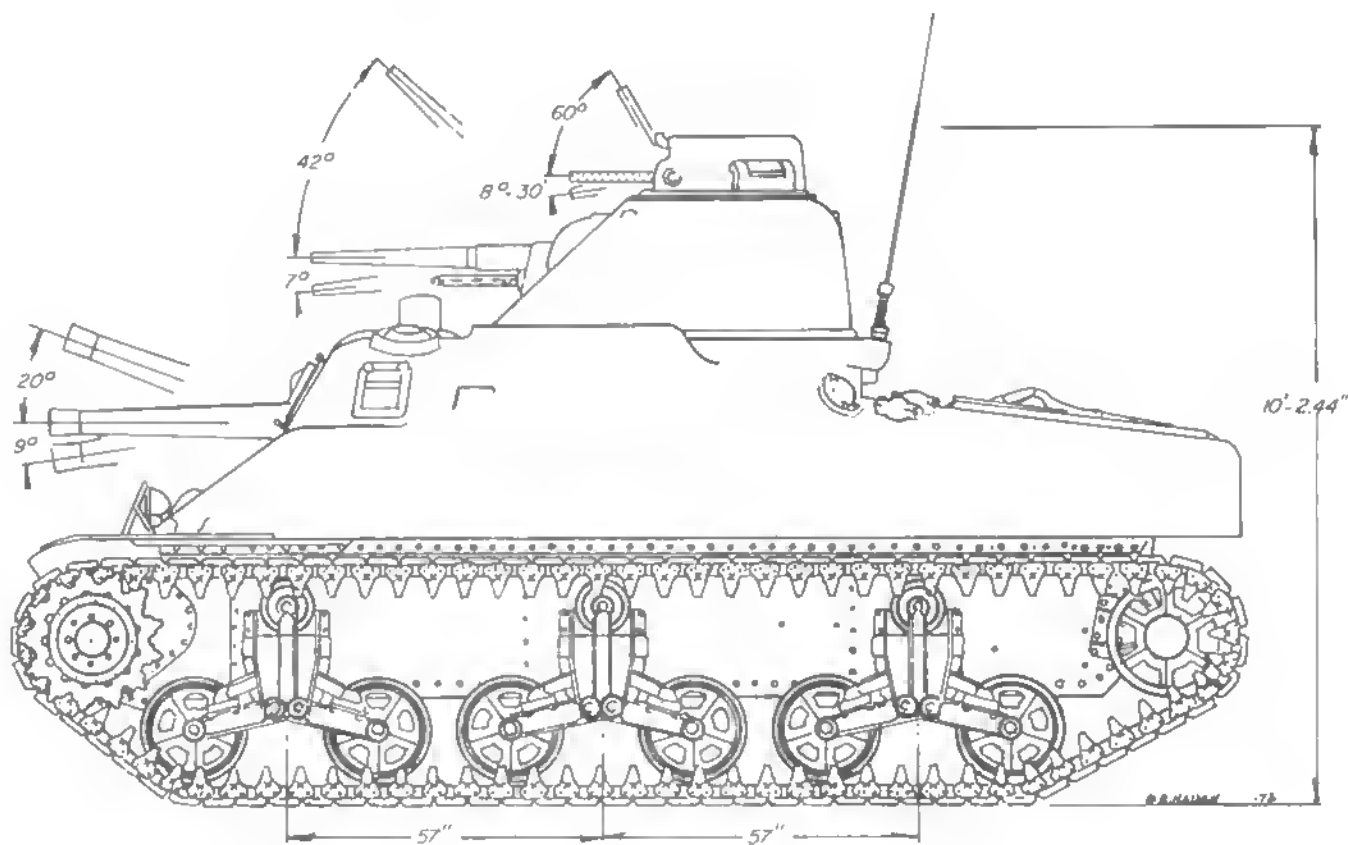
The first U.S. variation of the M3 - the M3A1 - went into production at the American Locomotive Company in February of 1942. It had been learned that riveted construction was far from ideal for armored vehicles, since the impact of a heavy shell frequently sent rivets ricocheting through the crew compartment. There were two alternate methods of construction - welding and casting. However, both required special skills that may not be evident. The M3A1 Medium Tank employed the latter method with the vehicle being cast in several separate segments; the basic hull, the barbette housing for the 75mm gun, the 37mm gun turret, and three separate pieces of the differential housing. The result was a substantial improvement in armor protection over the riveted hull version. Not only were the rivets eliminated, but the smooth, curved cast surfaces also increased the deflection effect against incoming projectiles.

A total of three hundred M3A1 Medium Tanks were constructed by American Locomotive and a number of these were equipped with Diesel engines, thereby becoming the M3A1 (Diesel). Further experiments with power plants were conducted, and a M3A1E1 was produced as a test vehicle utilizing three Lycoming aircraft engines. Production of the M3A1 Medium Tank was halted in August 1942, as the M4 "Sherman" Medium Tank reached full-production status.

M3 and M3A1 Medium Tanks served in the U. S. Army in many roles during the early years of the war. Numerous vehicles equipped the newly formed tank units of the expanded Armored Force in 1941 and 1942; some were even supplied without guns as ordnance production lagged behind that of the vehicle itself. When the U.S. Army participated in "Operation Torch", the invasion of North Africa from the west, the standard medium tank was the M3 and M3A1, as M4 production and delivery (and training) was inadequate to meet all the requirements. Even after the arrival of the Sherman tank in substantial numbers, the M3 series soldiered-on, with conversion to armored recovery vehicles for maintenance and armored units.



The **M-3A1** Medium Tank



DATA TABLE

Designation: U.S. - Medium Tank M3A1
British - Lee Mark II.

Production:

Mfg.: American Locomotive
Begun: February 1942
Completed: August 1942
Total Units: 300

General Dimensions:

Length: 18 feet, 6 inches
Width: 8 feet, 11 inches
Height: 10 feet, 3 inches
Weight: 63,880 pounds (combat loaded)
Ground Clearance: 17 1/2 inches

General Performance:

Road Speed: 25 m.p.h.
Trench Crossing: 6 feet, 2 inches
Vertical Obstacle: 2 feet
Maximum Grade: 30 degrees (60%)
Fording Depth: 3 feet, 4 inches
Turning Radius: 37 feet

Engine(s):

- Model Wright Continental R975-EC1
Type: Radial Aircraft
Cylinders: 9
Horsepower: 340
Fuel: Aviation Gasoline
- Model Guberson T-1400
Type: Diesel
Horsepower: 345
Fuel: Diesel Fuel

Transmission:

Type: Synchromesh
Speeds, Forward: 5
Speeds, Reverse: 1
Steering: Controlled Differential

Suspension:

Type: Vertical Volute Spring
Number of Bogies: 3 per side
Number of Road Wheels: 6 per side
Type of Wheels: Rubber Tired
Size of Wheels: 20 x 9
Idler Wheel: Adjustable Eccentric
Idler Size: 22 x 9
Final Drive Type: Herringbone
Number of Teeth: 13

Tracks:

Type: Steel Block, with Rubber Pads
Number of Shoes: 156 per track
Pin Type: Rubber Bushed
Width: 10.9/16 inches
Ground Contact: 147 inches
Ground Pressure: 13.25 lb./Sq. inch
Pitch: 6 inches

Vision:

Periscope M1: 1
Periscope M3: 1
Protectoscopes: 1

Armament: Main:

75mm Gun M2
Mount: M1 in Sponson
Elevation: 20 degrees
Depression: -9 degrees

Traverse: 15° Right, 15° Left
Muzzle Velocity: 1290 l.p.s.
Secondary:

37mm Gun M6

Mount: M24 in Turret
Elevation: 60 degrees
Depression: -7 degrees
Traverse: 360 degrees
Muzzle Velocity: 2900 l.p.s.
Machine Guns:
Number: 4
Type: .30 cal. M1919A4
Location: 1 in Cupola
1 coaxial with 37mm
2 in Bow, operated by the Driver

Small Arms: Quantity and Type:

- 1 - .45 cal. Thompson SMG
- 6 - .45 cal. Automatic Pistols
- 12 - Hand Grenades

Ammunition Stowage:

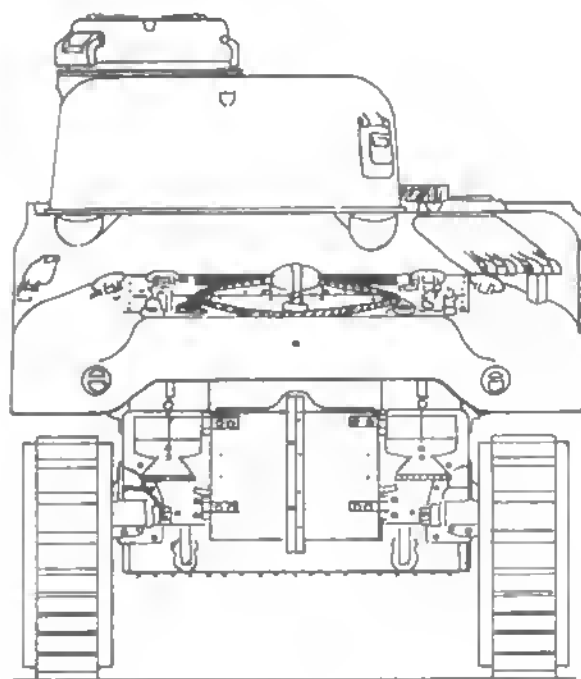
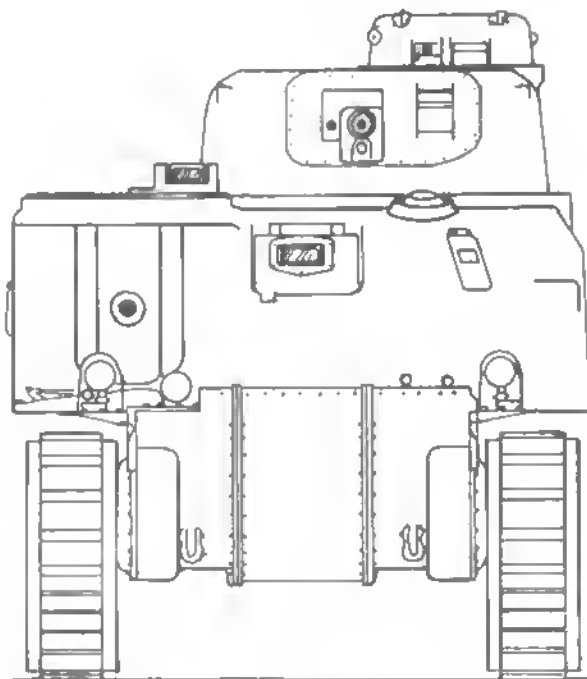
75mm AP & HE: 46 rounds
37mm AP: 178 rounds
.45 cal Ball: 1200 rounds
.30 cal Ball: 9200 rounds

Armor: Cast Homogeneous

Thickness:	Actual
Hull Front, Upper:	2 inches
Hull Front, Lower:	1-1/2 inches
Hull Sides:	1-1/2 inches
Hull Rear:	1-1/2 inches
Hull Top:	1/2 inch
Turret Front:	2-1/4 inches
Turret Sides:	2-1/4 inches
Turret Rear:	2-1/4 inches
Turret Top:	7/8 inch

DRAWN BY

D.R. Haugh



MODELING IN 1:87TH SCALE

by Thomas Levin

Up to the time that I started "modeling" in "HO" (or 1:87th) scale, I suppose that I was a conventional modeler. I made models from the kits released by Tamiya, as they came out, and occasionally I started a scratch-built model, or made a conversion on one of the kits. My main interest for some years had centered around the armored vehicles of the German Wehrmacht and I collected data and scale drawings of these vehicles as I found them. Something, however, was lacking.

After a good deal of thinking and time, I hit upon my problem. All this time, I seemed to have been modeling without a basic theme or goal in mind. I made models that did not fit into an overall collection, just because they were available. I was fast running out of space to store my finished models, and I was not really happy with my accumulation of reasonably well-done, but large-size models. What I had really wanted was a coordinated collection of all of the armored vehicles



of the Wehrmacht. . . . and, these models had to be in a scale (or size) that would allow easy display and/or storage. 1:32nd or 1:35th scale was just too large. . . . so I started looking at the smaller scales. After looking at 1:76th scale and discarding it for various reasons (mainly concerned with the availability of kits and accessories), I settled on 1:87th scale for basic reasons as follows:

1. A fairly extensive line of 1:87th scale "kits" (actually completed "toys") were available in the AHM "Minitanks" range of vehicles. This group of models included a large number of German World War II, vehicles of the type that would start a collection out well.

2. Extensive model accessories, including numerous miniature figures, were available in the form of "HO" model railroading accessories. These provided tools, storage boxes, barrels, structural shapes and other items that proved to be very useful in converting and detailing models.

3. The size of the resulting miniature vehicles was near ideal for collecting and display. At the present time, I have 89 models completed and these fit on two shelves of my glass showcase! I have been invited on two occasions to put on a display of models before local organizations and the boxing and transportation of the collection was easily done. Try this with 1:35th scale models!

I started my collection and modeling in "HO" scale by making an extensive list of every vehicle that I wanted to make a model of. This covered two pages, and needless to say, I have but gotten a start towards my eventual goal. I next compared my list with the available vehicles in the "Minitank" line, and I found that I could easily sort my list into three categories. First, I could start my modeling collection by superdetailing and finishing basic existing models in the "Minitank" line. Secondly, after getting started and as time became available, I could convert and modify the existing models to create different variants (of the basic vehicle) or even different vehicles. And then, finally, came the scratch-building of models that were just unavailable.

When I reached this latter stage, I found that I possessed a growing collection that was just what I had been looking for all along.

Some caustic reader, at this point, will undoubtedly jump forward with the comment that "Minitanks" are not commonly available. . . . where could he (and I) find such models as the Sturmgeschütz III that seems to be out of production? Well, maybe I was lucky. I know two collectors of "Minitanks", who were also wargamers (an addiction I also share). These fellows had

started collecting with the idea of creating a Panzer-Division and a U.S. Armored Division in miniature with all vehicles. In many cases, I was able to purchase one, two or even three damaged Minitanks from them at little cost. In other cases, I was able to make a trade.

As the accompanying photos illustrate, you can take the basic Minitank and with some

- Continued on Page 29 -





Book Review: Schützenpanzerwagen in Action by Uwe Feist, Captions by Kurt Rieger
(Squadron/Signal Publications, Warren, Michigan, 48pp, \$3.95)
Review by James Steuard

Subtitled as "Armor Number 2", this publication continues the series that was initiated by the Signal Publication on the German Panzer III, medium tank. In photographic album format, it covers the German light and medium armored halftracks (the Sd. Kfz. 250 and 251 series) used by reconnaissance and armored units in World War II. Text is at a minimum in this new booklet, with two pages of developmental history and a one page listing of vehicular variants. There are two pages of "scale" drawings; one of the Sd. Kfz. 250/1 and the other of the Sd. Kfz. 251, Ausf. A. I say "scale" as the two drawings are not in the same scale, no scale is indicated and both drawings are of doubtful use to modelers. The remainder of the book consists of good quality photographs and their captions; there are 16 photos of the light Sd. Kfz. 250 and 67 photos of the Sd. Kfz. 251 series of vehicles. Although some of the photographs have appeared in other publications (mainly from the Aero series authored by Uwe Feist and Walter Spielberger), there are a good many fresh photos that will be of special interest to those interested in German vehicles. The photos are accompanied by some 15 pen-and-ink drawings of tactical markings and insignia, and the front and back covers feature very well done color renderings of various vehicles.

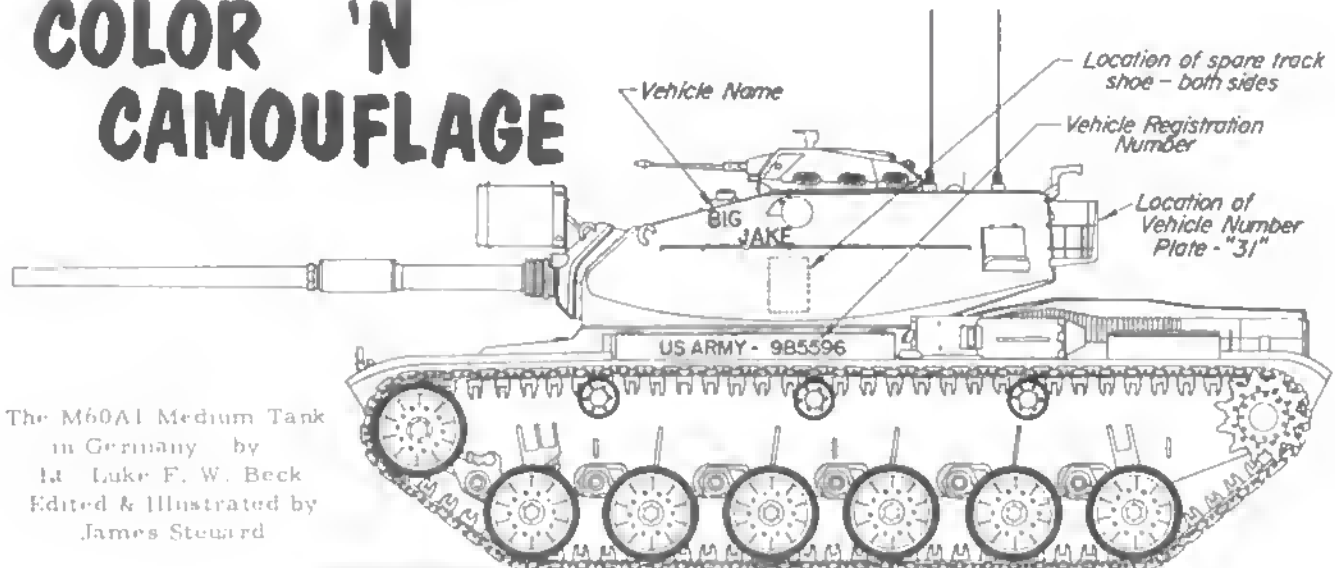
My greatest fault with this new publication lies in the photographic captions. I feel that the authors have lost an excellent opportunity to impart new and interesting information through this medium. The captions are all too brief and they impart little that is not obvious in looking at the subjects pictured. In addition, several of the captions include wrong information which tends to confuse the reader; for example, on page 15, a caption wrongly indicates that the Ausführung A and B of the Sd. Kfz. 251 can be identified by three visors on each side of the vehicle. In reality, only the Ausführung A had these visors. Another caption on page 17 indicates that the Sd. Kfz. 251/10 vehicle was first issued in 1940, a statement that does not agree with documentation. The captions include information on color and camouflage patterns, most of which are stated as fact but appear to be the opinion of the authors.

However, the above shortcomings of the publication are not to be considered major. The book gives the reader a fresh photographic look at the commonly used armored halftracks of the Wehrmacht, and if you're a modeler or you're interested in vehicles of the Panzer- and Panzergrenadier-Divisionen, this book should have a prominent place on a shelf in your library.

Book Review: Guide to Combat Weapons of Southeast Asia. Edited by Donald B. McLean
(Normount Technical Publications, Forest Grove, Oregon, 348pp, \$7.50)
Review by Duane L. Thomas

There exists in South-East Asia today, the widest sampling imaginable of new, obsolescent and obsolete weapons. This volume deals with weapons which are found in Communist China, North and South Vietnam, Cambodia, Laos, Thailand, Burma and Malaya. Over 170 weapons are covered; rifles, carbines, assault rifles, submachine guns, light and heavy machine guns, mortars, rocket launchers, recoilless weapons, AT guns, artillery, AA guns, armored vehicles and SP artillery. The book's format consists of a clear, full-page (generally) photograph of each weapon or vehicle, with data and background text on the facing page. While the book is small (4-1/2" by 7"), the content is amazing. If you want clear and detailed photographs of such weapons as the Soviet 82mm recoilless rifle, the Soviet ZPU-2 and ZPU-4 anti-aircraft gun mounts, and the Soviet ZU-23 anti-aircraft gun, then this book is a must for your library. Although somewhat expensive, the number of rare, clear photographs and unusual data makes this book a good purchase.

COLOR 'N CAMOUFLAGE



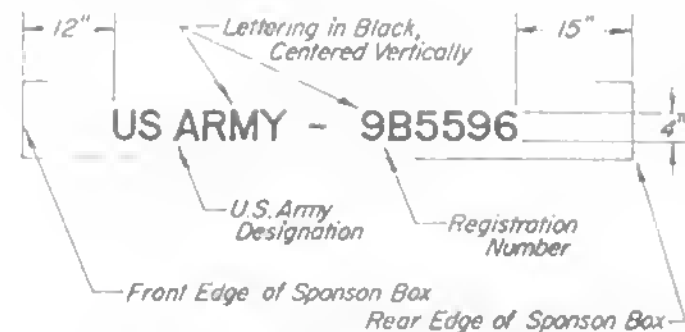
The M60A1 Medium Tank
in Germany by
Lt Luke F. W. Beck
Edited & Illustrated by
James Steward

Left Side View - M60A1 Medium Tank of Company B, 5/68th Armor

The subject of this issue's article takes a somewhat different approach in that it covers a tank in current use. The author of this article is a Platoon Leader in Company B, 5/68th Armor, one of the Tank Battalions assigned to the 8th Infantry Division (Mechanized) stationed in West Germany as part of the U.S. Army's commitment to NATO. The tanks of the 5/68th Armor (in common with other tank units in Europe) consist mainly of M60A1's with a few M60's still in service. These vehicles are painted with an overall coat of semi-gloss Dark Olive Drab paint, as depicted below. The vehicles are factory painted but touch-up is mixed by adding 1 part of Black paint to 5 parts of standard Olive Drab paint.

Part of the markings on M60A1 tanks are factory applied; these consist of the U.S. Army designation and the vehicle Registration Number. These are applied in flat black to the long sponson (or storage) boxes on the side as shown to the left.

It is interesting to note that M60A1's of the 5/68th Armor lack the white identification stars and yellow circle bridge classification markings that are otherwise common on U.S. Army vehicles.



Lettering on Side Sponson Boxes - M60A1

Unit Identification markings appear in white on both the front and rear of the author's M60A1, applied as shown on the opposite page with 3" stencils; these are divided into two groups. In all cases, the left marking consists of the Division and Battalion designation, while the right marking indicates the Company and the individual vehicle number.

The author's tank also carries a personal "nickname" painted on both sides of the turret, close to the rangefinder hoods. This nickname, "BIG JAKE", is painted in flat bright green 6" high characters as indicated below.

For identification within the unit, a 14" by 14" plate is fastened to the rear of the turret storage basket in a centered position. This plate, painted Olive Drab, has the vehicle number painted



Vehicle Name - Left Side of Turret



on it in 4-1/2" high white block numbers, as shown on the opposite page. This plate serves to locate and identify the company's tanks from the rear when in action.

For those readers who are interested in storage and individual vehicle details, the author's tank has the following:

1. Two Five-gallon Gasoline containers, holding oil, are fastened behind the small sponson boxes on each rear fender. For this purpose, there are straps and brackets on the fenders.

2. Four Duffle Bags (one for each crew member) are carried, upside down, in the Turret Storage Basket. The crew's sleeping bags (or bedrolls) are tied to the Storage Basket hanging outboard to the rear of the rack. In addition, a canvas "tarp" is stored, folded-up, in the right rear part of the Storage Rack.

3. The antenna mount forward of the Loader's Hatch is not used (the hole is covered with a metal plate). The second antenna is instead mounted in a mount to the rear of the Loader's Hatch.

4. The Tank Commander's Periscope is wider than normal and is similar to the Gunner's, except for a front cover which is hinged at the top and which opens forward.

5. The Gun Mantlet is covered with a Mantlet Cover.

6. A Spare Track Block is hung on both sides of the turret below the rangefinder hoods. This location is shown in the side view (opposite) was dashed lines. These blocks are hung by the center guides.

7. Two Tow Cables are fastened to the turret below the Turret Storage Basket and extend around the sides of the turret forward.

8. Searchlight (Xenon) Storage Brackets are fastened to the turret on the right rear, below the dome.

9. The Left Fuel Filler Cover is missing. The Right Fuel Filler Cover is painted flat yellow with a crossing Olive Drab stripe.

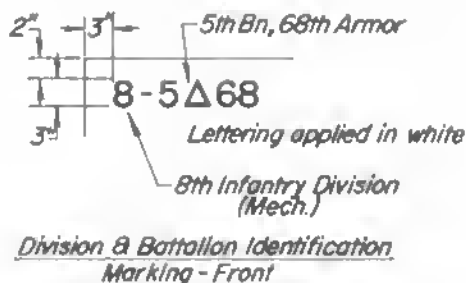
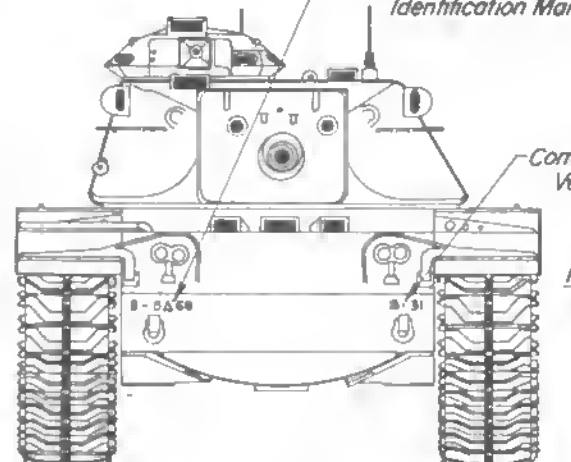
It should be mentioned that while some of the above individual differences appear to be more or less standard, others such as the 14" by 14" identification plate and the stowage of the crew's duffle bags are unit policies.

The mixture of black, white and flat green markings seem to show the in-between status of markings on vehicles of the U.S. Army in Germany. While the current emphasis is on "subdued" markings, both in size and in choice of color, (this is the rationale behind the deletion of the white stars and the bridge markings) armored units continue to apply unit identification markings and vehicle numbers in white for greater visibility.

Division and Battalion Identification Markings

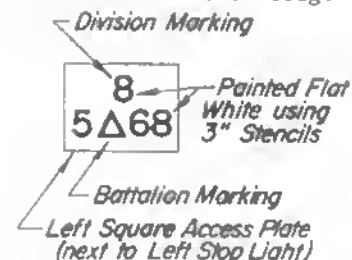
Company and Vehicle Markings

Front View -
M60A1 Medium
Tank

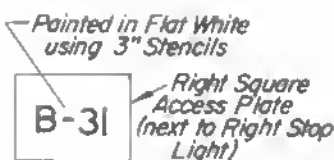


Division & Battalion Identification
Marking - Front

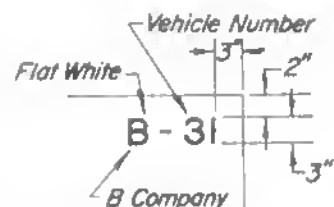
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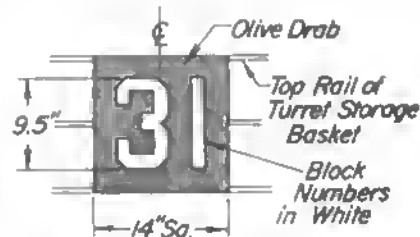
Division & Battalion Markings -
Left Rear



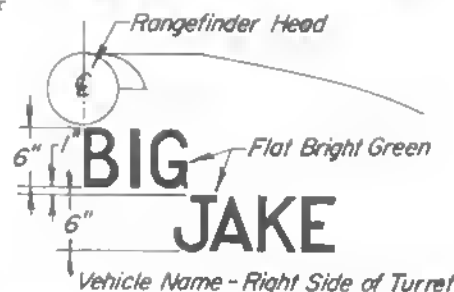
Company & Vehicle Markings -
Right Rear



Company & Vehicle Markings -
Hull Front



Vehicle Number Plate Centered on
Rear of Turret Storage Basket



GERMAN ARMORED FLAK

by James Steuard

III. Initial Formations

The first organization created by the German Wehrmacht to use the new Flakpanzer 38(t), which was described in Part I. of this article, was a separate Platoon that was designed to be attached to the Headquarters Company (or Stabs-Kompanie) of German Army or Waffen-SS Panzer-Regiments. This separate anti-aircraft platoon was designated "Panzer-Fla-Zug (2cm Flak 38)", and it was organized under Kriegsstärknachweisung (KSN) 1195, dated 1 February 1944. In actuality, the armored Flak platoon was closer to being a miniature "company" instead of a platoon: it consisted of 1 officer, 24 non-commissioned officers and 45 enlisted men, with a total of 22 vehicles.

This first German armored anti-aircraft platoon was organized under a small platoon headquarters, which consisted of the Platoon Leader (normally an Oberleutnant or 1st Lieutenant) and his enlisted driver in a light car, and two enlisted motorcycle messengers, provided with the late-war 350cc solo-motorcycles (such as the DKW or the NSU). These messengers provided communications between gun sections when they were dispersed in the field.

The combat elements of the platoon consisted of three gun sections, each equipped with one Kettenkrad (tracked motorcycle) and four Sd.Kfz. 140 "Flakpanzer 38(t)" anti-aircraft vehicles. Each of the gun sections was under the command of a senior non-commissioned officer; the section leader of the First Section also acted as an assistant platoon leader, assuming command whenever the officer was not present. The sections consisted of 7 non-commissioned officers and 11 enlisted men; the First Section had one additional enlisted man, a range finder operator who rode in the headquarters Kettenkrad. Each of the gun sections could be sub-divided into two Squads (each with two Flakpanzer 38(t)'s) if the tactical situation required sub-division. In this case, the two-vehicle Squads could be attached to individual Panzer-Kompanien as needed.

The Panzer-Fla-Zug was provided with a small maintenance section, with two NCO's and 5 enlisted men. This section was equipped with two medium trucks; one (which was covered) as a personnel carrier and the other (which was open-topped or canvas covered) as a spare parts truck. The section had three mechanics, a signal repairman and two weapons repairmen, and they had such tools and equipment to effect normal repair and maintenance of the platoon's rolling stock. When required, the larger maintenance sections of the Panzer-Regiment (the Panzer-Werkstatt-Kompanie) provided technical assistance and repair facilities.

In order to be fully separate and independent, the Panzer-Fla-Zug also had its own organic supply section, which consisted of two vehicles, both open-topped medium trucks. One vehicle was provided for transportation of vehicular fuel, while the second vehicle carried extra ammunition for the fast firing 2cm anti-aircraft guns. This small section had 1 NCO and 3 enlisted men, one of whom was also a weapons helper for the maintenance section.

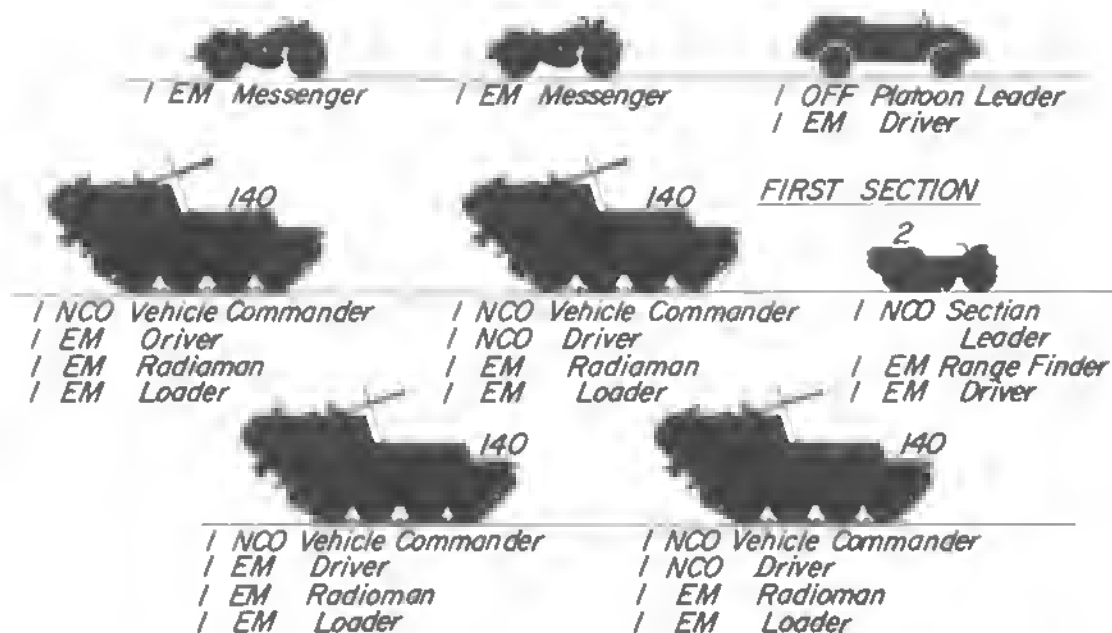
Photographic evidence shows that these armored anti-aircraft platoons equipped with the Flakpanzer 38(t) saw combat during the Normandy invasion, and also on the Ostfront during the spring and summer of 1944, until superseded by more powerful and numerous weapons. While little has been found regarding tactical employment, it can be assumed that the usual basic element of the platoon was the two-vehicle Squad, which could be deployed to company-level for protection against low-flying enemy fighter-bombers (or Jabos). In this role, the vehicles did not have a means of accurately determining range (and thus "lead") and were probably used to fire at targets of opportunity when their unit of attachment came under attack. In another role, the four vehicle gun section became the basic unit, with each of the three sections being deployed to protect one of the three headquarters of the regiment (the two battalions and regimental headquarters) where they could provide more powerful assistance for the headquarters position, supplementing the small anti-aircraft sections already assigned at the battalion level. In this role, the gun sections came directly under command of the battalion commander.

Shortly after their appearance in combat, it became evident that the Flakpanzer 38(t) was only an interim solution to the rising anti-aircraft problem. The 2cm Flak 38 anti-aircraft gun was unable to provide a sufficient volume of fire to seriously deter attacking enemy aircraft, and the 12 guns of the platoon when deployed were too scattered to offer good control. The answer to the complex question of anti-aircraft protection was a second generation of vehicles, the Flakpanzer IV, to be covered in Part III. of this article.

PANZER- FLIEGERABWEHRZUG (2cm FLAK 38)

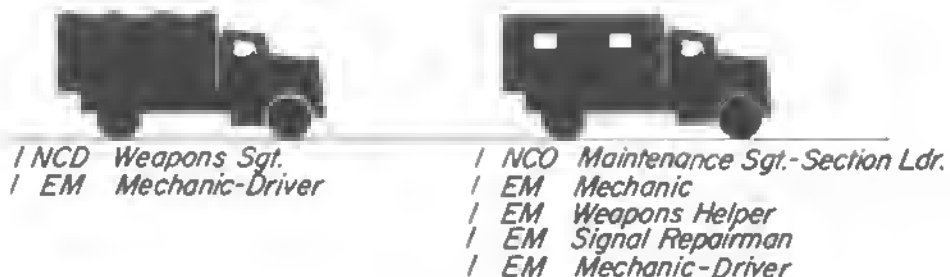
KSIN 1195 of 1 February 1944

PLATDDN HEADQUARTERS

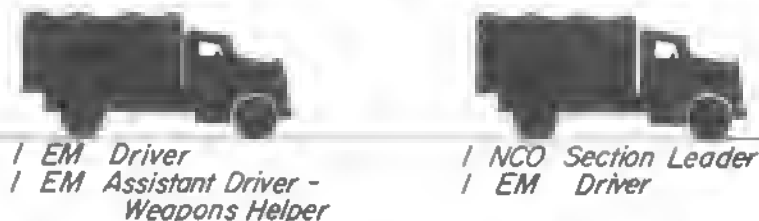


SECOND SECTION & THIRD SECTION are identical to First Section, less the Range Finder Operator. In the absense of the Platoon Leader, the First Section Leader took command (acting similar to a Platoon Sergeant).

MAINTENANCE SECTION



SUPPLY SECTION



The

A.13 Cruiser

in the Western Desert

by Thomas Jentz

Some time ago (Vol.II., No.7 to be exact), AFV-G2 published an article on the British A.13 Cruiser tank. Much of that article was based on experiences in the French campaign of 1940; however, the A.13 also played a major part in a vastly different campaign - the desert war in North Africa, under greatly different conditions of terrain and climate.

In the French campaign on the continent, the A.13's had gained a reputation for mechanical reliability but the new desert environment raised problems the designers had not envisioned. The cooling system, though adequate for the temperate climate of Western Europe, was sorely taxed by the 100°F. plus heat of Libya. The filters were not fine enough to keep sand out of the engine and track failure became a major problem after the first 2000 miles, the normal life expectancy of the vehicle. Nevertheless, the A.13 performed better than such contemporaries as the Matilda.

The A.13's employed in the desert were nearly all of the Mark II. (or Mark IIA.) variety (otherwise known as the Cruiser Tank Mark IV. and Mark IVA.). The principal distinction between these two variants was the coaxial machine gun - a Vickers .303 caliber in the Mark IV. and a Besa

7.92mm in the Mark IVA; and they differed from the Mark I. in increased armor protection.

The principal opposition facing A.13's came in the form of the Italian M-13/40 Medium and the German Pzkw. II. A, B and C, Pzkw. III. F and G, and Pzkw. IV. D whose comparative strengths are shown in the table at the bottom of the page.

In the table the "Maximum Penetrating Range" is the furthest range that the vehicle's armament can penetrate at least 50% of the front of the A.13 Mk.II. The "Limit of Vulnerability" is that range within which the

vehicle can be penetrated by the 2-pdr. gun of the A.13. It should be remembered that penetration given for the German 7.5cm KwK L/24 is based on a special type of ammunition and that this weapon had a relatively low muzzle velocity and less accuracy. The axis weapons, however, enjoyed the advantage of having a high explosive filler in their AP rounds, compared to the simple solid shot of the British 2-pdr.

In September 1940, the 2nd Bn, Royal Tank Regiment arrived in Egypt; and, while its establishment still included a number of earlier Cruisers, the larger portion of its tanks were A.13's. By December approximately 50 of 7th Armoured Division's 306 tanks were A.13's and in January 1941, 5th Bn, RTR arrived in the Western Desert with 58 A.13's, all well past their prime of life. Over half of these tanks were in the workshops by the time the Germans launched their offensive in

ENEMY TANKS VERSUS THE A.13

Opponent Vehicle	M-13/40	Pzkw.II.	Pzkw.III.G	Pzkw.IV.D
Gun	47mm L/32	2cm KwK	5cm KwK L/42	7.5cm KwK L/24
Maximum Penetrating Range	1000 Meters	100 Meters	1500 Meters	2000 Meters
Limit of Vulnerability	1400 Meters	1100 Meters	1300 Meters	1300 Meters

March of 1941, and in the ensuing campaign, 23 A. 13's of 5th RTR were lost. Meanwhile, enough additional vehicles were gleaned from base workshops to partially equip two Squadrons of the 1st Bn, RTR for the defense of Tobruk. (By November, a total of 32 overhauled A. 13's were with the Tobruk garrison.

On May 12th, Churchill's "Tiger" convoy arrived in Alexandria carrying, among other things, 15 A. 13 Mk. IVA. tanks; however, they arrived too late to take part in "Operation Brevity" which was to commence on 15 May. For this attack, the 2nd RTR had been re-equipped with 29 Cruiser tanks of various types (including a few A. 13's). "Brevity" proved indecisive; but, by mid-June of 1941, the British were back on the offensive with "Operation Battleaxe". This time, enough A. 13's were available to equip one full Squadron ("C") of the 2nd RTR in addition to those assigned to the Tobruk garrison. However, the successor to the A. 13 had arrived on the scene and from June onwards the older Cruisers were gradually replaced by the A. 15 "Crusader". Nevertheless, in November the A. 13 still made up a substantial part of the Eighth Army tank strength with four attached to 7th Armoured Division H.Q., sixteen with the 7th Hussars and 52 with 2nd RTR. A few more A. 13's were landed in December with the 1st Armoured Division and these remained in service until the Spring of 1942. The last A. 13's to see combat were three that were attached to the 9th Lancers. These were exchanged for Crusaders on April 4th, 1942 and the combat career of the A. 13 Cruiser came to an end.

DATA TABLE: CRUISER TANK MK. IVA. (A. 13 MARK II A.)

Crew: Four: Commander, Driver, Gunner, Wireless Operator-Loader	Suspension: Type: Christie, Independently Sprung Road Wheels Road Wheels: 4 per side Road Wheel Diameter: 2'-8" Sprocket: Enclosed Coll Shock Absorbers: 8 Double-Action Telescopic	Armament: Main: (Mark IVA, CS) Gun: OQF 3" Howitzer Mk. I Caliber: 76.2mm L/25 Traverse: 360° (Hydraulic-Operated Turret) Height of Tube: 6'-3" Sight: Telescope, Sighting, No. 31 Mark II. (1.0X) Gunner's Field of View: 50° Effective Range: 2400 yards HE 1700 yards Smoke Ammunition Stowage: 41 Rounds HE and Smoke	
Dimensions: Length: 19'. 9" Width: 8'. 4" Height: 8'. 6" Ground Clearance: 1'. 4" Weight: 33,040 lbs. (16.5 t.)	Treads: Type: Dry-Pin Forged Steel Shoe Width: 9 7" Spacing: 7'. 6.75" Center to Center Pitch: 4. 1/8" No. of Shoes: 119 per Tread Length of Ground Contact: 11'-6"	Armament: Secondary: Gun: Tank Machine Gun, Besa Mark I, Caliber: 7.92mm Traverse: Coaxial with Main Armament Sight: As for Main Armament Effective Range: 1500 yards, 1200 yards on Mark IVA CS Ammunition Stowage: 3750 Rds. (Ball, AP and Tracer)	
Performance: Speed: 30 m.p.h. Vertical Obstacle: 2'-6" Trench Crossing: 7'. 6" Climbing Range: 100 Miles Fuel Consumption: 0.75 miles per Gallon Power to Weight Ratio: 23 hp. per ton	Armament: Main: (Mark IVA,) Gun: OQF 2-Pdr Mks IX, X, and XA Caliber: 40mm Traverse: 360° Hydraulic-Operated Turret Elevation: 20° Depression: 15° Height of Tube: 6'-3" Sight: Telescope, Sighting, No. 30 Mk I or Mk. IA (1.9X) Gunner's Field of View: 21° Ammunition Stowage: 87 Rounds Effective Range: 1800 yards, Graduated Sights	Production: Total Units: 172 Manufacturers: Newfield Mech. Installation & Aero: 141 L.M.S.: 31 Wee Department (General) Numbers: T7030 - T7060 Inclusive T9160 - T9190 Inclusive T15215 - T15294 Inclusive T18131 - T18160 Inclusive	
Power Plant: Engine Model: Newfield Liberty Cylinders: 12 Fuel: Gasoline Coolant: Water Ignition: Spark Compression Ratio: 5.2 to 1 Bore & Stroke: 4.92" by 5.0" Capacity: 166.3 cu. inch Horsepower: 340 b.h.p. @ 1500 c.p.m.			
Transmission: Type: Mechanical Speeds Forward: 4 Speeds Reverse: 1			
Armour: Type: Homogeneous Rolled Steel Construction: Plates Riveted to Frame			
Thickness of Plates	% of Target Area	Actual Thickness	Angle from Vert.
Front: Cupola	4.7%	25mm	0° (Round)
Turret Front	15.7%	25mm Plus 5mm	11°
Gun Mantlet	8.9%	25mm Plus 9mm	
Superstructure	10.6%	30mm	0°
Driver's Plate	7.1%	30mm	0°
Glacis Plate	10.9%	10mm	60°
Hull Front	12.3%	30mm	0°
Hull Front Lower	12.3%	30mm	60°
Side: Cupola	1.8%	25mm	0° (Round)
Turret Side	14.2%	20mm Plus 5mm	15° & 30°
Gun Mantlet	1.0%	25mm	0°
Superstructure	13.7%	8mm Plus 14mm	0°
Hull Side	56.8%	8mm Plus 14mm	0°
Rear: Cupola	4.7%	25mm	0° (Round)
Turret Rear with Extra Plate	15.7%	14mm Plus 5mm	0° & 30°
Turret Rear	13.5%	14mm	0°
Superstructure	19.1%	8mm	0°
Hull Rear Upper	4.0%	8mm	75°
Hull Rear Upper	7.0%	8mm	20°
Hull Rear	7.0%	8mm	0°
Hull Rear Lower	7.0%	8mm	60°
Driver Cover	5.3%	8mm	Rounded
Roof:	6mm	90°
Floor:	6mm	90°

Note: Percentages do not equal 100% as turret and running gear are included in total of Turret Areas

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AFV INQUIRY

Armor Question from Readers, with
Answers from the AFV-G2 Staff.

Did the German Panzer III, Ausführung M see service in North Africa?

Our sources indicate that the Ausführung (or Model) M of the Panzer III entered production in May of 1943 and troop deliveries began near the end of that month. As the surrender of all German forces in Tunisia took place at the beginning of May 1943, it is clear that this version of the Panzer III did not serve in North Africa. Photographic evidence does indicate, however, that the similar Ausführung L did see service in small numbers, mainly with the 10. Panzer-Division (that came in as 11th hour reinforcements). Apparently, supply difficulties prevented most of these Model L vehicles from service with the D.A.K. Of course, a number of the 75mm KwK armed conversions of the Ausführung L saw service in Tunisia; these appear to have been the conversion forerunners of the Panzer III, Ausführung N.

Could you give me some production information on the German Jagdpanzer IV, that was armed with the 7.5cm gun from the "Panther" tank?

This version of the Jagdpanzer IV, was initially designated as the "Panzer IV, /70" and production figures were found for the vehicle under this different designation. The vehicle first entered service during August 1944. Production statistics show monthly production as follows:

Month	Number
August 1944	60
September 1944	101
October 1944	147
November 1944	203
December 1944	255
January 1945	235
February 1945	155

Total 1944 production was 766 units, while total production indicated was 1156 (unfortunately our statistics do not go past February 1945). It is not clear where (and when) these vehicles first appeared in combat on the Eastern Front, however, Waffen-SS Panzer-Divisions operating on the Western Front began to receive these vehicles in the Autumn of 1944, and they were used very successfully by the 12. SS-Panzer-Division "Hitlerjugend" in August 1944. Apparently, the first of these vehicles were supplied to this division. The "Bestand" (or Number of Vehicles in Service) Records indicate that the following number of vehicles were on hand on the first day of the months listed:

September 1944	34
October 1944	94
November 1944	211
December 1944	382
January 1945	575
February 1945	665

Officially, the Jagdpanzer IV, was to equip the 1. and 2. Kompanien of Panzer-Division anti-tank (or Panzerjäger) battalions, and it does appear that most of these tank destroyers were employed in these units.

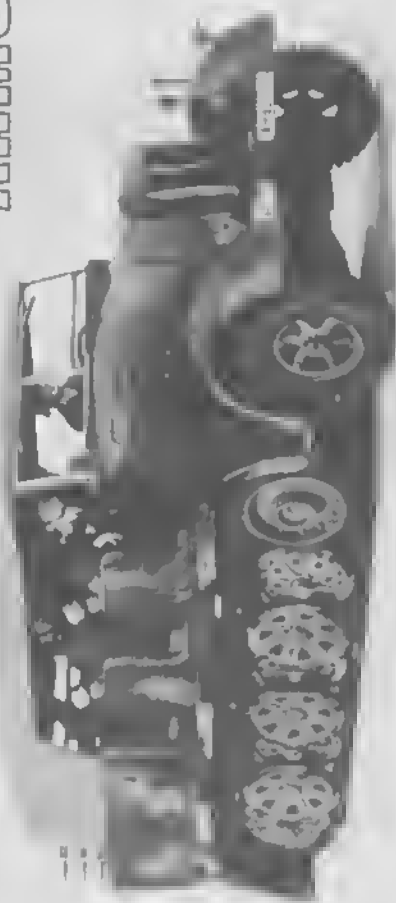
While I am familiar with the German 2cm and 3.7cm Flak (or AA) guns, I have seen one reference listing a 3cm Flak gun. Was there such a weapon, or is this a typographical error?

Yes, there was such a 3cm Flak gun, however, it appears to have been largely experimental and not produced in any quantity. This weapon utilized gun mounts from the 2cm Flak 38 and 2cm Flakvierling 38 to make single and quadruple barrel versions. The gun that was used was the Luftwaffe 3cm Mk 103 aircraft cannon; this weapon was of simple construction and was fed from a rotary drum magazine. Apparently these weapons were to have been mounted on submarines as anti-aircraft protection, but it is not clear how many were made or how they were actually used.

Questions for this section are solicited from the readership. If an immediate answer is required, readers should provide a self-addressed, stamped envelope for this answer.

ARMOR

in MODELS



On the left is an example of the Tamiya Sd.Kfz. 78-ton Halftrack, complete with crew. This is a photo provided by Tamiya and it illustrates the kit "from the box" with no modifications. The paint finish is especially well done, with nice "wear" highlights and a well used look. There are several interesting conversion possibilities for modelers with this kit.

The photos below show a M4A1 "cast hull" Sherman tank, as used by tankers of the 1st Armored Division in Tunisia in 1943. This model was constructed by Jerry Finney Jr. of Bellflower, California, from the Revell and Tamiya Sherman kits, plus quite a bit of hull fabrication. Especially note the detail at the rear of the hull, the rolled canvas "tarp" and the tool stowage. The M4A1 was used throughout 1943 and 1944, it was the only version of the M4 to have the rounded cast steel hull instead of the more common welded angular hull.



"Photo Epilog" -

External Effects of High Explosive
Anti-Tank (HEAT) Ammunition.....



The photos on this page were submitted by Lt. Dwight C. McLemore, and illustrate a battered M4A3E8 of the Republic of Korea (ROK) Army. This tank had apparently been used as a target vehicle on a firing range after becoming obsolete for the ROK Army's armor units. After seeing service as a target, it was brought (by transporter) to a position south of the Korean De-Militarized Zone where it now stands apparently as a "decoy" vehicle (opposing the North Korean forces).

While the photos provide information on details for modelers, they also show the external effects of High Explosive Anti-Tank (HEAT) ammunition on an armored vehicle. The side (hull and turret) of the Sherman shows evidence of at least 19 hits by this type of ammunition. Lt. McLemore is not sure whether the tank was hit by 90mm (tank) or 106mm (recoilless rifle) shells (possibly both) as the effect is similar. Note that the penetration holes are "sub-caliber", i.e. smaller than the projectile size and that the edges of the holes are tipped from the melting effect. Also note the radiating lines around the holes caused by the fragmentation and blast of the shell when it detonated outside the vehicle. Any one of these hits would have disabled the tank or eliminated the crew through flying molten metal and secondary fragmentation.

The T-12 75mm Gun Motor Carriage (Continued from Page 7)

This author's driving impressions of the Half-Track, while motorizing on improved roads was reminiscent of a discordant noisy nightmare, rather like driving a ten-ton kitchen cabinet on a washboard. Visibility, even with the door armor folded, was lousy. Vibration and noise was very bad by any objective standard. As mentioned earlier, the hardware used to secure moveable armor sections was rather makeshift, to the point that every heavy piece of steel that was supposed to be still never stopped shaking until the engine stopped running. The ride (?) of the vehicle was such that running over anything larger than a dime was to be avoided at all costs. And, speaking of costs, a set of tracks could be expected to last less than 1000 miles on improved roads. (At today's prices, about \$1.00 per mile.)

If all of the old war "flicks" gave you the idea that the Half-Track was a super-strong tree-smashing monster, that image was about right - a great tree-smasher, but a rather deficient combat vehicle.

The M1897A4 75mm gun mounted on the T-12 was the last variation of the world's first truly modern, rapid-fire, high-velocity artillery piece. The gun dated from the 1890's, having been designed as a horse-drawn French Army artillery piece. Still horse-drawn, both the French and Americans used the "75" throughout World War I. Since the A.E.F. came back from France with large stocks of the gun, a high-speed carriage was developed in the 1930's, to allow truck drayage.

In terms of destructive capability, the old gun was actually far superior to anything the Germans had to pit against it, save the very few 88's in the Tiger I, that saw African service. However, in addition to being handicapped by limited traverse, the sighting equipment of the 75mm gun was very simple and elementary. While the gun could dismantle most axis armor, success depended on Alvin York style marksmanship. It was simply a shame that virtually any Italian tank, German tank, or determined infantryman could shoot the "motor carriage" part of the T-12 out from under the gun with such ridiculous ease. Even the infantryman would not have had to be terribly determined! The 50mm and 75mm German tank guns, even at long range, could cripple the T-12. Even the 2cm Flak 38 on a light truck could dismantle the tank destroyer! After the tank destroyer capability was realized to be non-existent, and the T-12 became an infantry support weapon, the 75mm gun did an acceptable job.

While the T-12 was one of the more publicized Half-Track variants, it should be noted that almost every weapon in the American arsenal was at one time bolted to the basic Half-Track. A partial list would include the 105 mm howitzer, 75mm pack howitzer, 57mm anti-tank gun, 40mm anti-aircraft gun, 37mm in combination with twin .50 caliber MG's, Quad .50 MG's and Twin .50 MG's and 81mm mortars, as well as many one-off unsanctioned types. Part II. of this article will detail the T-12/M3 Gun Motor Carriage.

Hillersleben, A German Army Test Facility (Continued from Page 9)

"I" Platz, which was used for the construction and test of pilot fortifications, had to be another outstanding feature of Hillersleben, for it had facilities which consisted of a gantry firing structure permitting the firing of weapons vertically downward into the top of fortifications at zero range.

Today, there are probably many places in the United States that are comparable to Hillersleben in terms of facilities, but at the time, Hillersleben was unique. It is interesting to contemplate what might have happened if the scientists of Germany had not been forced to do the things that took them so far off the beaten path of weapons research.

Modeling in 1:87th Scale (Continued from Page 18)

loving care and modeling skill, create a miniature that is a faithful replica of the real vehicle, complete with battle damage, missing and battered skirting, correctly dressed crew members, and accessory tools. You too can easily do what I am doing: make your own collection of miniatures in 1:87th scale.....British armored vehicles in North Africa.....armored vehicles of the Soviet Army.....or modeling the Wehrmacht in miniature. In future articles, I'll try to show some tricks on how it was done in my case. Why not give it a try.....you will probably find a real modeling challenge.

Editor's Note: As a part of our regular "re-run" of back issues, Volume II., Number 3 is now available. Contents include: History of the British 2nd Armoured Division, Color 'n Camouflage covering the Tiger I tank in Tunisia, the M-10 Tank Destroyer, the German Light Tank Company Circa 1940, and much more. 28 pages for the cost of 60¢ per copy, postpaid.....



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Letters to the Editor

To the Editor:

In answer to the 1:32 or 1:35th scale question, I think that 1:35th should be the "standard" scale. For one thing, the number of 1:35th scale AFV models outnumber the Monogram and Revell 1:32 scale vehicles. Also, Tamiya and Nito have begun production of 1:35th scale figures. Because there are more 1:35th models, conversions are easier because of numbers of different chassis. The production of metal figures should attempt a line of 1:35th figures. Monogram, Revell and Revell should also produce a few 1:35th scale vehicles. I personally am not buying 1:32nd scale kits as there is a difference.

R. B. Rivenburg
Wetzel, R.I.

To the Editor:

As a modeler and dealer, I and some cronies got a really big shock from an editorial-type article a few issues back that goosed at length on "ohall we establish a rigid scale that all North American AFV manufacturers should adhere to".

What does that person smoke? What N.A. manufacturers?

As a humor article, it was a great success.

E. Signon
Everett, Wash.

To the Editor:

My letter concerns the absolutely incredible letter you printed to the Letters to the Editor column in your Vol. 3, No. 9 issue. I am not prone to write in criticizing the views of others, but in this case I fear I cannot restrain myself.

While I am to no way associated with the Tamiya company or any other model concern, I feel Mr. R. McG.'s comments on the products of Tamiya are most unfair and border on old-fashioned nit-picking. Those insubstantial, glaring errors that he points out are for the most part inconsequential as to be unworthy of mention. I believe with the wealth of accurate, sometimes breathtaking detail that we consistently receive from Tamiya, a small, easily-corrected mistake on their part now and then can be quickly put right. As for his comments regarding no-dar-the-hull detailing, I cannot think of anything more ridiculous, as first of all most serious modelers must make their models on bases or dioramas, and second, who on earth goes around picking up lost model parts and turning them upside down?

While I do not doubt that the errors pointed out by Mr. McG. really do exist, I cannot help but wonder whether he spends more time looking for flaws than he does in producing a good, realistic-looking model. Those of us who have frequented model displays and conventions over the years have inevitably found that the fellows who bemoan, belittle and nit-pick at each other's new kits and the finished models of others are rarely able to do a first-rate model themselves! It is said that such a person "talks a good model".

If Mr. McG. is really so dissatisfied with the offerings of Tamiya, all I can suggest is that he take a long look at the AFV kits we were forced to build, say, 15 years ago! They seldom even resembled the vehicles they were intended to represent and alas these abominations. I can't shed too many tears about a hinge on a hatch of a Tamiya kit being "all wrong!" Look at some of those oldies and you probably won't even find the hatch shown!

D. Musick
Van Nuys, Calif.

To the Editor:

I am writing this letter about your article "Armor in Vietnam"; the M-48A3 Medium Tank, in Vol. 3, No. 9. For the sake of accuracy and state pride I feel I must point out the fact that the picture on page 22 has the tank commander flying the flag of Iowa, not the flag of Mexico. Shame, shame.

D. Cook
Council Bluffs, Iowa

(Editor's comment: Sorry 'bout that Residents of Iowa. In looking at the flag in the original photo with a magnifying glass, I am still not sure if I can see the eagle and snake emblem of Mexico, or the flying eagle emblem of Iowa. I guess it could be either! These members of our staff think "Mexico" but we have seen more Mexican flags here in California.)

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